

**What is claimed is:**

*Sub A* → 1. A system of inclined geosynchronous  
2 satellite orbits above a landmass comprising:  
3 a service area on a surface of the earth  
4 having a predetermined minimum elevation angle from  
5 the horizon;  
6 a satellite having an orbit with respect to  
7 the earth having sky track when viewed from within  
8 said service area; and  
9 an operating arc defined by a subset of  
10 points on said sky track over said service area, said  
11 satellite operating on said operating arc.

1 2. A system as recited in claim 1 wherein  
2 said orbit has a predetermined inclination with  
3 respect to an equatorial plane of the earth.

1 3. A system as recited in claim 1 wherein  
2 said orbit has a predetermined eccentricity.

1 4. A system as recited in claim 3 wherein  
2 said orbit has an eccentricity factor between about  
3 0.1 and 0.5.

1 5. A system as recited in claim 1 wherein  
2 said minimum elevation angle is greater than thirty  
3 degrees.

1           6. A system as recited in claim 1 wherein  
2 said minimum elevation angle is greater than sixty  
3 degrees.

1           7. A system as recited in claim 1 wherein  
2 in said orbital track having an apogee and a perigee,  
3 said apogee is over said service area.

*Sub a2*  
1           8. A satellite communications system  
2 comprising:  
3           a service area on a surface of the earth  
4 having a predetermined minimum elevation angle from  
5 the horizon;  
6           a satellite having an orbit with respect to  
7 the earth having a first fixed repeating sky track  
8 when viewed from within said service area;  
9           a ground station located within said  
10 service area;  
11           a first satellite having a first orbit with  
12 respect to the earth having a first sky track when  
13 viewed from within said service area;  
14           a second satellite having a second orbit  
15 with respect to the earth having a second sky track  
16 when viewed from within said service area;  
17           said first satellite having a first  
18 operating arc defined by a first subset of points on  
19 said sky track over said service area, said first  
20 satellite operating within the service area;

21            said second satellite having a second,  
22 operating arc defined by a second subset of points on  
23 the said second sky track within said service area,  
24 said second satellite operating within the service  
25 area.

1            2 9. A satellite communication system as  
2 recited in claim 1 wherein said first sky track and  
3 said second sky track are coincident.

1            3 10. A satellite communication system as  
2 recited in claim 1 wherein said first operating arc  
3 and said second operating arc having a respective  
4 first handover point and a second handover point for  
5 switching ground station operation between said first  
6 satellite and said second satellite.

1            4 11. A satellite communications system as  
2 recited in claim 1 wherein said first satellite and  
3 said second satellite are synchronized so that they  
4 are equally spaced in time.

1            12. A satellite communications system as  
2 recited in claim 8 wherein said first orbit and said  
3 second orbit have predetermined inclinations with  
4 respect to an equatorial plane of the earth.

1            5 13. A satellite communications system as  
2 recited in claim 1 wherein said first orbit and said  
3 second orbit have a predetermined eccentricity.

1        ~~6~~ 14. A satellite communications system as  
2 recited in claim ~~8~~ <sup>1</sup> wherein said minimum elevation  
3 angle is greater than thirty degrees.

1        ~~7~~ 15. A satellite communications system as  
2 recited in claim ~~8~~ <sup>1</sup> wherein said first ground station  
3 comprises a planar antenna.

1        ~~8~~ 16. A system as recited in claim ~~8~~ <sup>1</sup> wherein  
2 said eccentricity factor between about 0.1 and 0.5.

*Sub A3* →

1        17. A method of providing a system of  
2 inclined eccentric geosynchronous satellite orbits,  
3 the method comprising:  
4        specifying at least one geographic service  
5 area within which satellite coverage is to be  
6 provided, said service area having a minimum  
7 elevation angle thereabove;  
8        defining a pair of satellite orbits, each  
9 satellite orbit defining the orbit, each satellite  
10 orbit defining an orbital plane having an inclination  
11 with respect to the equatorial plane of the Earth,  
12 each orbit having a subset of points with sky track  
13 over the service area, each sky track having an  
14 operating arc corresponding to the region for which  
15 each of said pair of satellites operates.

- 10 18. A method as recited in claim 1/  
2 further comprising the steps of defining each orbital  
3 track to be coincident.